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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/696,436	10/24/2000	Ted J. Cooper	80398.P350	3904

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Los Angeles, CA 90025-1026

EXAMINER

YE, LIN

ART UNIT	PAPER NUMBER
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2615

DATE MAILED: 03/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/696,436	COOPER, TED J.	
	Examiner	Art Unit	
	Lin Ye	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to amended claims 1-20 filed on 11/26/04 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
3. Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hel-or et al. U.S. Patent 6,404,918 in view of Kimmel, IEEE Transactions on Image Processing, VOL. 8, No.9. and Ebel et al. U.S. Patent 5,717,781.

Referring to claim 1, the Hel-or reference discloses in Figures 1-3, an image processing method comprising: capturing a raw image (by image sensor, see Col. 3, lines 9-18; and the raw image 10 is shown in Figure 1); and providing edge enhancements (e.g., edge smoothing) to the captured image as part of a demosaicing process (See Col. 5, lines 56-63). However, the Hel-or reference does not explicitly shows an operation for increasing edge detail that also included in demosaicing process.

The Kimmel reference teaches an image processing method for demosaicing operation converts the raw image acquired with CCD sensor into a full color image. This processing includes steps picture reconstruction and enhancement. In the step of reconstruction the missing points along the edges are interpolated, the edge now become curves rather than points (e.g., this can be considered as increase edge detail, see page 1222-1223, Figure 4).

The Kimmel reference is evidence that one of ordinary skill in the art at the time to see more advantages the demosaicing process including a operation to increase edge detail so that “Superresolution” beyond the sensors resolution can be achieved by the demosaicing process without limited due to the physical structure of sensors (See page 1221, Introduction section). For that reason, it would have been obvious to one of ordinary skill in the art to see the operation for increasing edge detail also included in demosaicing process disclosed by Hel-or.

The Hel-or and Kimmel references do not explicitly shows the edge enhancement is also performed on the captured **raw** image instead the reconstructed image.

The Ebel reference teaches in Figure2, a raw lens image is captured from the camera and provided to the image processing system for inspecting ophthalmic lenses (See Col. 5, lines 47-50); and an edge enhancement operator is performed on the raw lens image to increase lens edge detail because gray level information alone is not sensitive enough to allow distinction between normal and defective regions of a lens edge (See Col. 9, lines 45-45-51). The Ebel reference is evidence that one of ordinary skill in the art at the time to see more advantages performing the edge enhancement on the captured raw image before any further image processing, so that the image data can be processed appropriately and not falsely reject

good lenses (See Col. 7, lines 3-8). For that reason, it would have been obvious to one of ordinary skill in the art to see the image processing system can perform edge enhancement on the captured raw image disclosed by Hel-or.

Referring to claim 2, the Hel-or, Kimmel and Ebel references disclose all subject matter as discussed in respected claim 1; the Hel-or reference discloses performing post demosaicing processing on the captured raw image (See Figure 3, after step 39 to generate new RGB image can be considered as post demosaicing processing); and outputting the processed image (in steps 36-37).

Referring to claim 3, the Hel-or, Kimmel and Ebel references disclose all subject matter as discussed in respected claim 1; the Hel-or reference discloses wherein providing the edge enhancements includes: creating a brightness map (image is then separated into a luminance band Y, and two chrominance bands, I and Q as shown in step 32 in Figure 3) of the captured image.

Referring to claim 4, the Hel-or, Kimmel and Ebel references disclose all subject matter as discussed in respected claim 1; the Ebel reference discloses wherein providing the edge enhancements further includes: detecting edges of the captured raw image using the brightness map (gray level criteria, see Col. 6, lines 62-67); creating a mask image as shown in Figure 8 from the edge detected brightness map (shows the five zones used in a lens, see Col. 9, lines 64-67); and Hel-or references performing unsharp edge enhancement (edge smoothing) from the masked image (Y image, See step 39 in Figure 3 and Col. 6, lines 53-60).

Referring to claim 5, the Hel-or, Kimmel and Ebel references disclose all subject matter as discussed in respected claim 1; the Hel-or reference discloses wherein providing the edge enhancements further includes: blending multiplicatively the unsharp edge enhanced image with the brightness map (Y image); (e.g., blending the isotropic smoothing process in step 38 to step 39 can be considered as blending multiplicatively the unsharp edge enhanced image with the brightness map).

Referring to claim 6, the Hel-or, Kimmel and Ebel references disclose all subject matter as discussed with respected to same comment as with claim 1.

Referring to claim 7, the Hel-or, Kimmel and Ebel references disclose all subject matter as discussed with respected to same comment as with claim 2.

Referring to claim 8, the Hel-or, Kimmel and Ebel references disclose all subject matter as discussed with respected to same comment as with claim 3.

Referring to claim 9, the Hel-or, Kimmel and Ebel references disclose all subject matter as discussed with respected to same comment as with claim 4.

Referring to claim 10, the Hel-or and Kimmel references disclose all subject matter as discussed with respected to same comment as with claim 5.

Referring to claim 11 (It should be noted that the preamble does not anticipate this claim), the Hel-or, Kimmel and Ebel references disclose all subject matter as discussed with respected to same comment as with claim 1.

Referring to claim 12, the Hel-or, Kimmel and Ebel references disclose all subject matter as discussed with respected to same comment as with claim 2.

Art Unit: 2615

Referring to claim 13, the Hel-or, Kimmel and Ebel references disclose all subject matter as discussed with respected to same comment as with claim 3.

Referring to claim 14, the Hel-or, Kimmel and Ebel references disclose all subject matter as discussed with respected to same comment as with claim 4.

Referring to claim 15, the Hel-or, Kimmel and Ebel references disclose all subject matter as discussed with respected to same comment as with claim 5.

4. Claims 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hel-or et al. U.S. Patent 6,404,918 in view of Ebel et al. U.S. Patent 5,717,781, Kimmel, IEEE Transactions on Image Processing, VOL. 8, No.9 and Lathrop et al. U.S. Patent 6,288,743.

Referring to claim 16, the Hel-or, Kimmel and Ebel references disclose all subject matter as discussed in respected claim 1, except the reference does not explicitly state a memory to store the captured raw image and a processor to provide edge enhancements to the captured image in the memory.

The Lathrop reference discloses in Figure 1, an image processing device comprising: a image sensor (CCD 16); a memory device (20) to store the captured image; and a processor (22) to provide edge enhancements to the captured image in the memory (Col 3, lines 30-42 and Col 4, lines 5-36). The Lathrop reference is evidence that one of ordinary skill in the art at the time to see more advantages the image processing device including a memory device to store the captured image for doing image processing (such as edge enhancements) late and avoiding to loss any image data during the processing. For that reason, it would have been obvious to one of ordinary skill in the art to see the image-processing device having a

Art Unit: 2615

memory to store the captured raw image and a processor to provide edge enhancements to the captured image in the memory disclosed by Hel-or.

Referring to claim 17, the Hel-or, Kimmel and Ebel and Lathrop references disclose all subject matter as discussed in respected claim 16, and the Lathrop reference discloses wherein the image capturing unit includes a charge-couple device (CCD) array (CCD 16, see Col. 3, lines 16-20) phototransistors, or photodiodes.

Referring to claim 18, the Hel-or, Kimmel, Ebel and Lathrop references disclose all subject matter as discussed in respected claim 17, and the Lathrop reference discloses wherein the output unit is a display device (display monitor 12).

Referring to claim 19, the Hel-or, Kimmel, Ebel and Lathrop references disclose all subject matter as discussed in respected claim 18, and the Hel-or and Lathrop references disclose all subject matter as discussed with respected to same comment as with claims 2 and 18.

Referring to claim 20, the Hel-or, Kimmel, Ebel and Lathrop references disclose all subject matter as discussed in respected claim 16, and the Lathrop reference discloses an imaging apparatus (digital camera 10) has a demosaicing processing (interpolate the Bayer pattern digital image data); and a post demosaicing processing (white balance, see Col. 3, lines 50-55) for a white balancing processing. The Lathrop reference is evidence that one of ordinary skill in the art at the time to see more advantages the post demosaicing processing is a white balancing or other image processing so that the scene illumination can be estimate more accurately. For that reason, it would have been obvious to one of ordinary skill in the

Art Unit: 2615

art to see the post demosaicing processing is a white balancing processing or a chromatic improvement processing disclosed by Hel-or.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

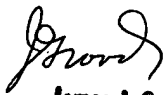
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lin Ye whose telephone number is (571) 272-7372. The examiner can normally be reached on Mon-Fri 8:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James J. Groody can be reached on (571) 272-7950. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2615

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


James J. Groody
Supervisory Patent Examiner
Art Unit 262-2615

Lin Ye
March 16, 2005